

CLAIMS

What is claimed is:

- 1 1. A method of stable incremental layout of a hierarchical graph
2 comprising:
3 determining a level of the layout for each new node of the graph using
4 information about hidden nodes of the graph;
5 determining positions of nodes on levels of the layout using information
6 about hidden nodes of the graph; and
7 determining coordinates of new nodes in the layout without using
8 information about hidden nodes.
9
- 1 2. The method of claim 1, further comprising inserting new levels of the
2 layout between existing levels when a new level is needed to contain a new
3 node.
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- 1 3. The method of claim 2, wherein nodes on existing levels retain
2 positions on the existing levels.
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- 1 4. The method of claim 1, wherein the determining steps are performed
2 to minimize visual changes in the layout as compared to an initial layout of the
3 graph.
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- 1 5. The method of claim 1, further comprising complying with quality
2 criteria.
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- 1 6. The method of claim 1, wherein the quality criteria comprises
2 minimization of edge crossings of the layout.
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1 7. The method of claim 1, wherein the quality criteria comprises
2 minimization of back edges of the layout.
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1 8. An article comprising: a storage medium having a plurality of machine
2 accessible instructions, wherein when the instructions are executed by a
3 processor, the instructions provide for stable incremental layout of a hierarchical
4 graph by determining a level of the layout for each new node of the graph using
5 information about hidden nodes of the graph, determining positions of nodes on
6 levels of the layout using information about hidden nodes of the graph, and
7 determining coordinates of new nodes in the layout without using information
8 about hidden nodes.
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1 9. The article of claim 8, further comprising instructions to insert new
2 levels of the layout between existing levels when a new level is needed to
3 contain a new node.
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1 10. The article of claim 9, wherein nodes on existing levels retain
2 positions on the existing levels.
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1 11. The article of claim 8, wherein the determining instructions are
2 executed to minimize visual changes in the layout as compared to an initial
3 layout of the graph.
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1 12. The article of claim 8, further comprising complying with quality
2 criteria.
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1 13. The article of claim 8, wherein the quality criteria comprises
2 minimization of edge crossings of the layout.
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1 14. The article of claim 8, wherein the quality criteria comprises
2 minimization of back edges of the layout.

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1 15. A method of stable incremental layout of a hierarchical graph
2 having nodes and edges comprising:
3 generating an initial layout of the graph; and
4 generating, as a result of a change in the graph, an incremental layout of
5 the graph based on the initial layout by performing
6 for each new node of the graph, determining a level of the
7 incremental layout using information about hidden nodes of the graph,
8 and inserting a new level in the incremental layout between existing levels
9 when the new level is needed to contain the new node;
10 for each level, determining positions of new nodes on each level of
11 the incremental layout using information about hidden nodes of the graph;
12 and
13 for each level, determining coordinates of new nodes in the
14 incremental layout without using information about hidden nodes.

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1 16. The method of claim 15, wherein nodes on existing levels retain
2 positions on the existing levels.

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1 17. The method of claim 15, wherein the determining steps are
2 performed to minimize visual changes in the incremental layout as compared to
3 an initial layout of the graph.

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1 18. The method of claim 15, further comprising complying with quality
2 criteria, wherein the quality criteria comprises at least one of minimization of
3 edge crossings, and minimization of back edges.

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1 19. An article comprising: a storage medium having a plurality of machine
2 accessible instructions, wherein when the instructions are executed by a
3 processor, the instructions provide for stable incremental layout of a hierarchical
4 graph by

5 generating an initial layout of the graph; and
6 generating, as a result of a change in the graph, an incremental layout of
7 the graph based on the initial layout by performing
8 for each new node of the graph, determining a level of the
9 incremental layout using information about hidden nodes of the graph,
10 and inserting a new level in the incremental layout between existing levels
11 when the new level is needed to contain the new node;
12 for each level, determining positions of new nodes on each level of
13 the incremental layout using information about hidden nodes of the graph;
14 and
15 for each level, determining coordinates of new nodes in the
16 incremental layout without using information about hidden nodes.

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1 20. The article of claim 19, wherein the determining instructions are
2 executed to minimize visual changes in the incremental layout as compared to
3 an initial layout of the graph.

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1 21. The article of claim 19, further comprising complying with quality
2 criteria, wherein the quality criteria comprises at least one of minimization of
3 edge crossings, and minimization of back edges.